

WHAT IS CLAIMED IS:

1. A method of forming a device isolation film in a semiconductor device, comprising the steps of:

performing an ion implantation for controlling a threshold voltage on a  
5 surface of a semiconductor substrate;

forming a trench to define an active region and a device isolation region by performing a photolithography process on the semiconductor substrate;

performing an oxidation process for extremely prohibiting ions, which  
10 are implanted to control the threshold voltage, from diffusing to the device isolation region and forming a side wall oxidation film at the side wall of the trench;

performing an ion implantation on the active region to compensate for ions for controlling the threshold voltage, which are diffused from the active  
15 region to the side wall oxidation film by the oxidation process; and

forming a device isolation film by burying the oxidation film inside the trench.

2. The method of claim 1, wherein, when forming the trench, the side  
20 wall oxidation film is formed to perform a rounding treatment on an upper portion or a bottom corner of the trench and to increase an adhesive strength of the oxidation film to be buried inside the trench, at the same time, and the film is formed to a thickness in the range of about 50 Å to 100 Å.

3. The method of claim 1, wherein the oxidation process is performed by a dry oxidation method at a temperature in the range of about 800°C to 950°C.

5           4. The method of claim 1, wherein the ion implantation process performed on an active region after the oxidation process is performed by a doze of  $1E11 \text{ ion/cm}^2$  to  $1E12 \text{ ion/cm}^2$  in an energy band of 10 Kev to 25 Kev.

5. The method of claim 1, wherein boron is used as an ion that is  
10   implanted for controlling the threshold voltage.